## Experiment No.: 03

## Name of the Experiment: Generate a Pulse Waveform and Use the Pulse Waveform as Gate Pulse in Thyristor of a Controlled Half-Wave Rectifier Circuit

## Required Software:

- MATLAB
- Simulink

## Objectives:

- To Generate Pulse Waveform Using Simulink
- To Implement Power Electronics Circuitry in Simulink
- Verify the Output of Controlled Half-Wave Rectifier Circuit Using Thyristor

## Pulse Wave Generator:

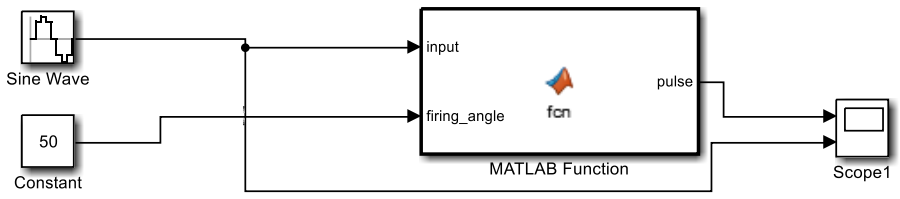


Figure 3.1.: Pulse Wave generator using MATLAB Function

## MATLAB Function Code:

```
function pulse = fcn(input,firing_angle)
if input > sind(firing_angle)
    pulse = 1;
else
    pulse = 0;
end
end
```

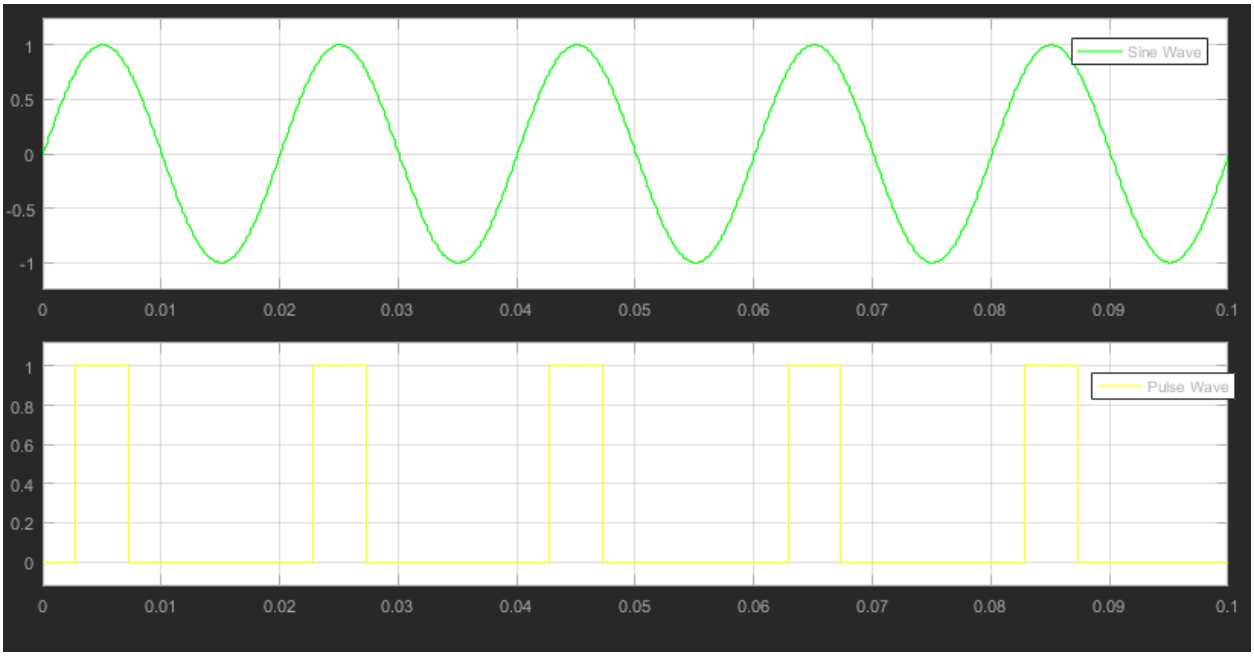


Figure 3.2: Input Sine Wave and Generated Pulse Waveform Using MATLAB Function

Required Circuit:

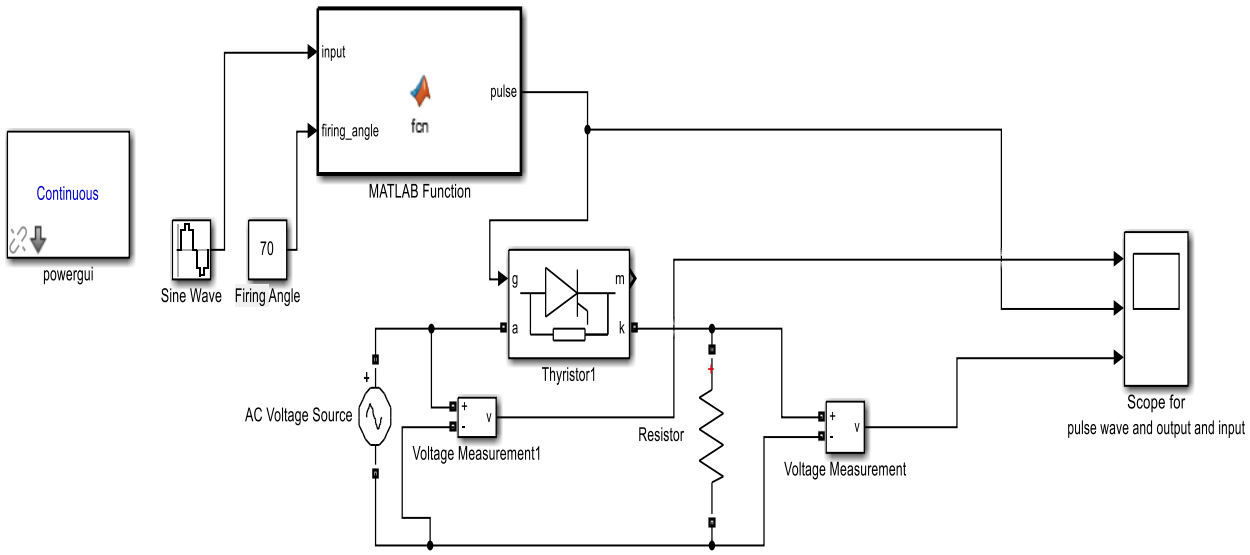


Figure 3.3: Controlled Half-Wave Rectifier Circuit Using Thyristor in Simulink

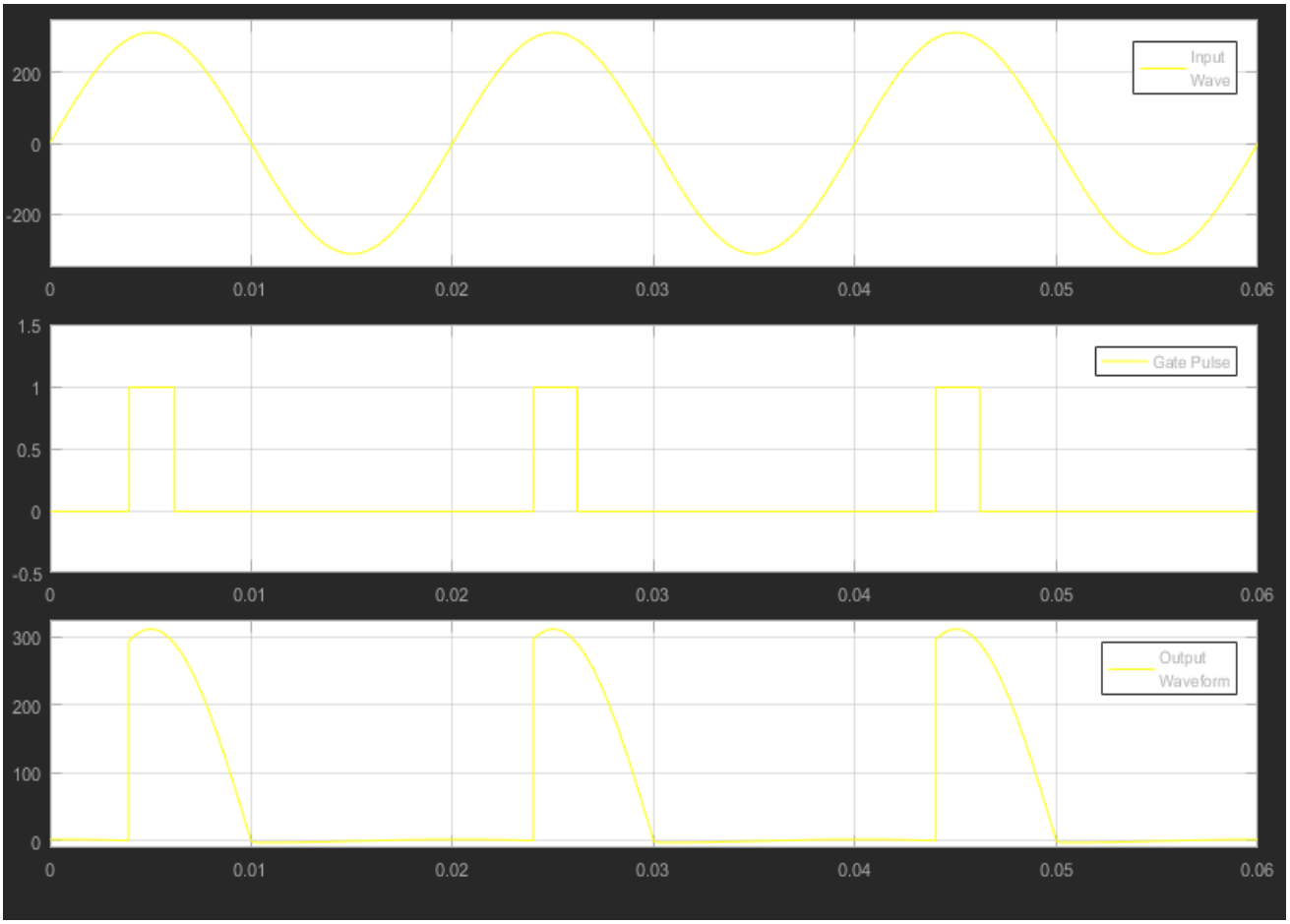


Figure 3.4: Input Waveform, Gate Pulse and Output Waveform of Controlled Rectifier Circuit in Simulink Where Firing Angle is 70degree

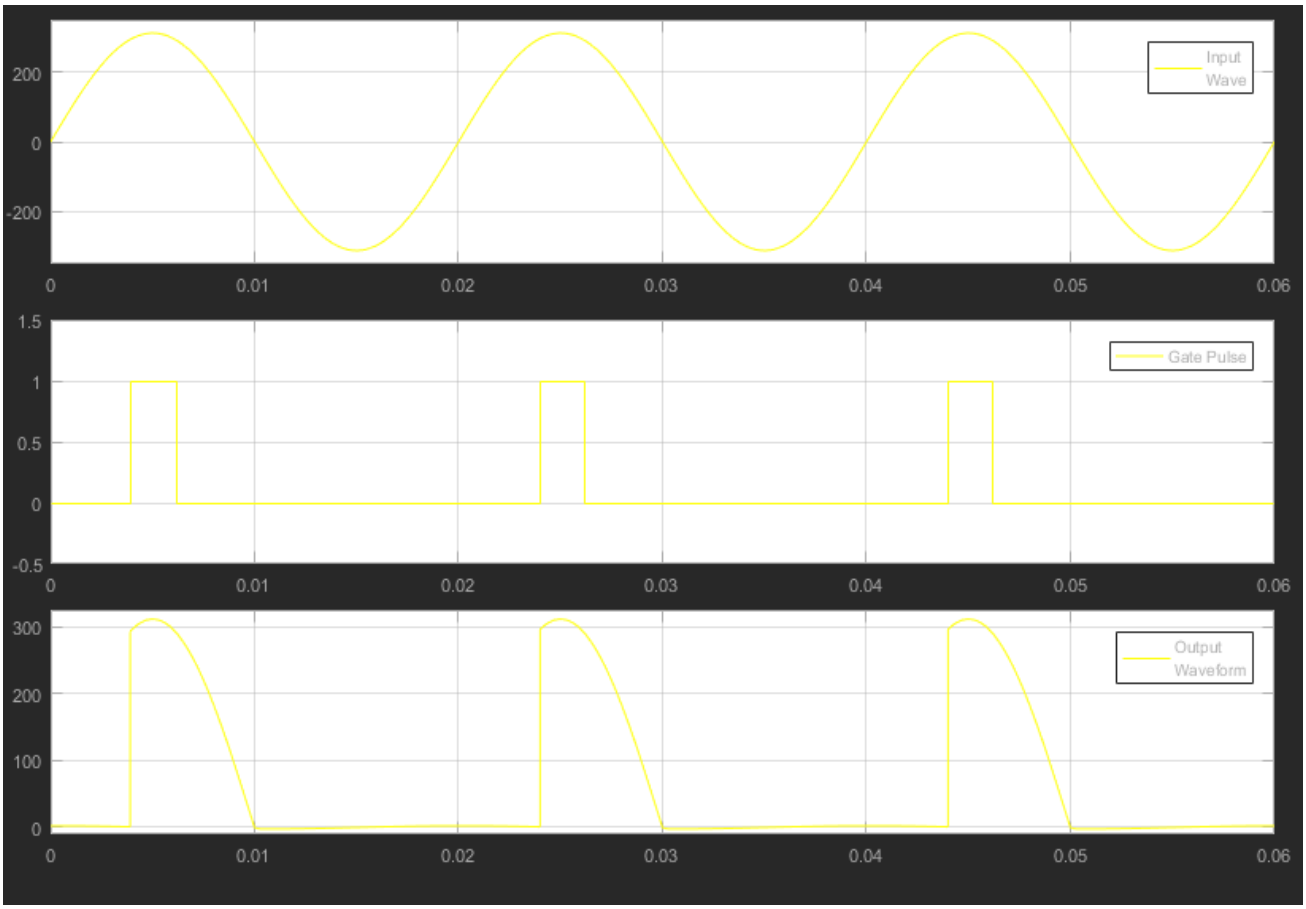


Figure 3.5: Input Waveform, Gate Pulse and Output Waveform of Controlled Rectifier Circuit in Simulink Where Firing Angle is 40degree

Discussion: Simulation of Controlled Half Wave Rectifier circuit is done and the output of the circuit is verified. Pulse Wave generator is designed using Simulink using MATLAB function where the firing angle can be varied with respect to input sinusoidal signal. The gate pulse is used in the Thyristor gate and for different values of firing angle the output is found from the rectifier circuit. So it can be said that from the simulation the desired output signal was found.